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### Fighting Poverty with Water

Jeff Raikes

*CEO, Bill & Melinda Gates Foundation*

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## Keynote Address

### Fighting Poverty with Water

**Jeff Raikes**

Chief Executive Officer, Bill & Melinda Gates Foundation

As CEO of the Bill & Melinda Gates Foundation and a native Nebraskan, Jeff Raikes shared information about the foundation and its role and approach to fighting poverty with water, as well as his personal interest in the subject. Raikes intended his address to

be provocative and to challenge the attendees to consider the actions that must be taken to address what he believes is a significant crisis but also a significant opportunity – the future of water for food.

Raikes' personal interest in water and agriculture is rooted in his family's history of farming in Nebraska since 1854. He described vivid memories of his father portraying the vast Ogallala aquifer as an incredible resource for agriculture, and his father's absolute belief and commitment to agriculture. "As a teenager I came away thinking, wow, we have this endless supply of water. Endless is what I thought," said Raikes, who grew up near Ashland, Neb.

During a recent conversation, Raikes learned that the water in his home area's river basin will likely be considered fully appropriated (having no additional irrigation capacity) within the next 12 months.

"Very stunning for me going from my discussion with my father as a teenager about this 'endless supply of water' to now recognizing what a challenge we have right here in my home state. So it's both with an institutional interest and a personal interest that I come here today to be a part of this very exciting session," Raikes said.

To frame the context for the Gates Foundation's interest in the area of water for food, Raikes gave a brief overview of the foundation's establishment and its work. The Gates Foundation was formed in 2000 with the guiding principle that all lives, no matter where they are lived, have equal value. The initial emphasis on global health was spurred by Bill Gates' learning of the huge number of children who die in developing countries each year from diarrhea caused by the rotavirus – deaths that could be prevented by treating the child with Pedialyte, as is done in the U.S. The idea that technologies in the developed world could save lives if made available in the developing world symbolized to Bill and his wife, Melinda, that the world does not treat all lives as equal. They believed the foundation could make a difference by bringing technology and science to the developing world.

Raikes said this mission expanded in 2006, when fellow Nebraskan Warren Buffett decided "to bet on Bill and Melinda ... to invest back into society the wealth that he's



Jeff Raikes

created via Berkshire Hathaway. That was a big part of the impetus for the Bill & Melinda Gates Foundation to get into what we call global development.” The foundation saw its role in global development as becoming part of a catalytic effort to help raise the 2.5 billion people in the world who live on less than \$2 per day out of extreme poverty. In addition to global health and global agricultural development, the foundation also invests in U.S. education to help more children finish high school and go to college.

### **Agriculture: A compelling solution**

The Gates Foundation believes, based on history and the work of the Green Revolution in the 1960s and 1970s and on its view of the future, that hunger and poverty are solvable. Almost 78 percent of the nearly 1 billion people who live on \$1 or less per day live in South Asia and Sub-Saharan Africa. “This year, for the first time ever, more than a billion people will go hungry. If you look to the future, where we’re now at 6.5 billion people, the world population is expected to exceed 9 billion by 2050. So that helps set some of the context of the crisis that I see as the opportunity,” Raikes said.

Agriculture is a compelling solution to reducing hunger and poverty. Historically, almost no country has risen out of hunger and poverty without increasing its agricultural productivity. But while agriculture is key, it is a solution that has been ignored, Raikes said. In Sub-Saharan Africa agriculture comprises almost 30 percent of gross domestic product, yet agricultural spending is less than 5 percent of government budgets. This problem is exacerbated by disinvestment in foreign aid over the past 20 years, with the percentage of foreign aid directed to agriculture dropping from about 13 percent in 1985 to less than 4 percent in 2005. The result: hundreds of millions of farmers realize just a fraction of their potential.

The Gates Foundation has set a key goal of helping 150 million smallholder farmers triple their income by 2025. “If we can do that, we can help them lift themselves out of extreme poverty, and we can help them create new opportunities for their children,” Raikes said.

A few core principles drive the foundation’s work in this area. The work focuses on Sub-Saharan Africa and South Asia because about 80 percent of the challenge exists in those regions. The foundation emphasizes smallholder farmers as the starting point for fighting poverty and reducing hunger. Women are at the center of these efforts because they comprise about 80 percent of the labor force in agriculture in these regions.

The Gates Foundation’s approach involves significant investments in partnerships because the obstacles and the solutions to reducing hunger and poverty span so many sectors. One example is the Foundation’s Alliance for a Green Revolution in Africa, a partnership with the Rockefeller Foundation. “That’s a key part of why we wanted to participate in this conference, because of the partnerships that you will form in taking on the issues of water,” Raikes said.

The foundation also believes it is important to support the full range of farmers’ needs, which translates into four key initiatives in its agricultural development strategy. The first is science and technology, with a focus on research and development of crops using plant breeding techniques to produce hardier and more nutritious crops. The second is farmer productivity. Growth in the number of agricultural dealers is a way to provide



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quality seed, fertilizer and irrigation to farmers, and also a means of providing a support network for training and education. The third is market access. “We believe strongly in market access,” Raikes said. “If farmers have access to markets, if they have a sense that they’ll have the opportunity to sell their output, then they will have the ability to be able to make investments in the right kind of inputs, the right kind of practices that will improve their productivity.”

Combining market access with farmer productivity and the right science and technology supports the range of farmers’ needs. But the foundation also believes it is important to invest in policy and statistics, its fourth key initiative, so farmers and policymakers are informed. That also will be critical in the area of water management, Raikes said.

### Water, the critical challenge

Agriculture and water are inseparable. “You know, in each of the areas I just mentioned, water is key,” Raikes said. “It’s a critical issue. In many cases it’s a critical limitation. And we come together probably in some cases with different perspectives, but I think we can all agree that it’s a critical challenge, one that we must take on, and I think that’s why you’re here.”

Many approaches to water management have not worked or have been inadequate, Raikes said. “It’s time for all of us to come together and demand of ourselves and of our colleagues new innovation, new approaches, because collectively you have the power to help hundreds of millions of people move from extreme poverty.”

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Raikes showed a slide of Lake McConaughy, Nebraska’s largest reservoir on the Platte River. It was 22 miles long when he was born. Now it’s 16 miles long and at 35 percent of capacity. “I put this picture in to illustrate that this is a challenge here in our country as well as a global challenge, and that’s why we’re excited about the idea of the Global Water for Food Institute,” he said.

To give a sense of global contexts, Raikes compared maize or corn production practices in the U.S., India and Africa.

**Irrigation.** In the U.S. less than 20 percent of the corn crop is irrigated. In India, more than 40 percent is irrigated, and in Sub-Saharan Africa, less than 5 percent is irrigated.

**Policy.** U.S. policy is changing because of greater recognition that water resources are fully appropriated and must be better managed. Raikes suggested India still has an outdated policy developed 50 years ago to improve agriculture production and reduce hunger. Aggressive government policies encouraged use of fertilizer and heavy irrigation, and electricity was effectively free. Policymakers have since learned that the wrong economic incentives led to overuse of water. In the case of Africa, Raikes suggested the real challenge is a lack of policy, a lack of investment in the infrastructure that would make irrigation possible.

**Productivity.** Countries experience significant differences in terms of yields and water use. Average corn yields are about 9.5 tons per hectare in the U.S., about 2.4 tons per hectare in India and about 1.8 tons per hectare in Africa.





Raikes summarized and gave examples of the challenges arising from each context and said he hoped they would serve as a road map for the key challenges to address in the conference working groups.

**Overuse.** The water resources in extensive areas of northwestern and southern India are designated as overexploited, critical and semi-critical, a situation that has occurred in these areas in the last 20 years.

**Underuse.** In South Asia, the Middle East and North Africa, nearly 40 percent of cropland is irrigated. In Sub-Saharan Africa less than 5 percent of the cropland is irrigated, Raikes said, but the investment potential for irrigation is exciting. He cited figures recently released by Africa Infrastructure Country Diagnostic, showing profitable areas for irrigation of Sub-Saharan Africa totaling 32 million hectares. “If you could just imagine what could happen with 10 percent of that opportunity being converted into effective irrigation, it would be a significant improvement to the lives of those people and to the contribution to the food supply,” Raikes said.

**Inefficient use.** Raikes showed a chart comparing water use per unit of maize or corn production in cubic meters per kilogram, with the U.S. at 0.57, India at 3.05 and Nigeria at 5.34. “When you overlay what you saw earlier in terms of productivity or yields with water use, you see that today we have great inefficiencies in how we use water,” Raikes said, “and this is an area that we think there’s a lot of opportunity for innovation, a lot of opportunity in science and technology.”

Malawi is a good example, Raikes said. The rainfall in Malawi, if properly managed and made available in reservoirs with better soil management, could yield 8 tons of maize per hectare. Today, it yields just eight-tenths of a ton per hectare – 10 times less than its potential.

Jeff Raikes’ keynote address



Hand watering crops in Senegal

Photo courtesy of United States Agency for International Development

**Changing water demands.** Water use changes as countries' economies develop. This is an important consideration for prioritizing policies and a place where innovation is needed, Raikes said. Comparing agriculture, domestic and industrial usage in the three regions, he showed that U.S. total water use is 7,000 liters per person per day, with 4,000 of those liters going to agriculture. In India total use is less than 3,000 liters per day, with about 2,500 liters for agricultural use. In Ethiopia, total use is less than 2,000 liters per day, with almost all used for agriculture. Human consumption of water is largely through agriculture throughout the world, but there are significant differences. More important is projecting what will happen as economies develop and how that will change water demands. This underscores the importance of innovative approaches that will improve water use efficiency and proper resource management, Raikes said.

**Changing water supply.** Showing a map of Africa from the Intergovernmental Panel on Climate Change Fourth Assessment Report, Raikes cited the large areas in northern and southern Africa predicted to have a 20 to 50 percent decrease in available precipitation by 2090. A large part of southern Africa that historically has been a significant breadbasket is predicted to have a 50 percent decrease. What does this mean for the institute's priorities? "It means that we have to have the agility to be able to respond. It means that we have to have the adaptability in terms of crops," Raikes said. "I'm showing this in Africa, but I know that this is something that's going to be an issue here in the state of Nebraska. I think we will need crop adaptability in terms of being able to handle higher temperatures and being able to handle less water."

### **The Gates Foundation's early approach to water**

An example of the foundation's investment in research and development in this area is its work with CIMMYT, the International Maize and Wheat Improvement Group. A \$40 million, five-year grant aims to produce water-efficient, drought-tolerant maize that is expected to help 30 to 40 million farmers and result in a 20 to 30 percent yield improvement. "Again, we like to think about the numbers, what's the impact going to be," Raikes said.

An investment in tools and technologies related to water and international development enterprises is a \$13 million, four-year grant to develop micro-irrigation technologies with the goal of helping 100,000 farmers double their income, reduce their costs by 50 percent and increase their yields by 30 percent.

A four-year \$10 million grant focused on 120,000 women in agriculture will create community workers who can help others develop market links and learn to use water sustainably. The goal is to have household income improvements of 75 to 100 percent through better support, training and education from the community itself.

In the public policy arena, the foundation is investing in a three-year, \$10 million project with the International Water Management Institute to develop technology, policy and strategy recommendations for agricultural water management. The goal is to help 1 million farmers boost yields and income within five years. With the right in-country strategies, the program could potentially help 65 million farmers.

### **Key challenges for the conference**

"Now I'd like to turn it around and talk a little bit about my challenge to you," Raikes

said. “All lives, no matter where they are being led, have equal value. So when we look back at the Green Revolution, when we look back at what’s happened in agricultural investment over the last 25 years, what lessons have we learned? What mistakes have been critical and what do we do to avoid them? What metrics and targets will galvanize innovation? What science and technology advances should be prioritized? What key information gaps can you fill, and how can you partner with other players, both public and private, to have the greatest impact?”

These are the challenges, Raikes said, and the questions he hoped would be considered in discussions throughout the conference. The Gates Foundation is conscious of the key role that water plays in agriculture, and also that the foundation is a small part of the ultimate solution.

“We’re honored to be here and to be a part of this conference,” Raikes said. “There is so much opportunity. We must seize it. We must fight poverty with water.”